

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
10 September 2004 (10.09.2004)

PCT

(10) International Publication Number  
**WO 2004/076375 A2**

- (51) International Patent Classification<sup>7</sup>: C04B
- (21) International Application Number: PCT/US2004/005676
- (22) International Filing Date: 26 February 2004 (26.02.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/450,563 26 February 2003 (26.02.2003) US  
60/499,453 2 September 2003 (02.09.2003) US  
60/537,207 18 January 2004 (18.01.2004) US
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**  
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHOD OF WASTE STABILIZATION WITH DEWATERED CHEMICALLY BONDED PHOSPHATE CERAMICS

(57) Abstract: A method of stabilizing a waste in a chemically bonded phosphate ceramic (CBPC). The method consists of preparing a slurry including the waste, water, an oxide binder, and a phosphate binder. The slurry is then allowed to cure to a solid, hydrated CBPC matrix. Next, bound water within the solid, hydrated CBPC matrix is removed. Typically, the bound water is removed by applying heat to the cured CBPC matrix. Preferably, the quantity of heat applied to the cured CBPC matrix is sufficient to drive off water bound within the hydrated CBPC matrix, but not to volatilize other non-water components of the matrix, such as metals and radioactive components. Typically, a temperature range of between 100°C-200°C will be sufficient. In another embodiment of the invention wherein the waste and water have been mixed prior to the preparation of the slurry, a select amount of water may be evaporated from the waste and water mixture prior to preparation of the slurry. Another aspect of the invention is a direct anhydrous CBPC fabrication method wherein water is removed from the slurry by heating and mixing the slurry while allowing the slurry to cure. Additional aspects of the invention are ceramic matrix waste forms prepared by the methods disclosed above.

(19) World Intellectual Property  
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(43) International Publication Date  
10 September 2004 (10.09.2004)

PCT

(10) International Publication Number  
**WO 2004/076375 A3**

(51) International Patent Classification<sup>7</sup>: **A62D 3/00**,  
B09B 3/00, G21F 9/00

(21) International Application Number:  
PCT/US2004/005676

(22) International Filing Date: 26 February 2004 (26.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
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**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the International search report:  
20 January 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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WO 2004/076375 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/05676

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A62D 3/00; B09B 3/00; G21F 9/00

US CL : 588/2, 9, 10, 15, 252, 253

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 588/2, 9, 10, 15, 252, 253

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,830,815 A (WAGH et al.) 03 November 1998 (03.11.1998), columns 3-7	27-28, 30-37
Y		1-26, 29
Y	US 5,732,367 A (YOST et al.) 24 March 1998 (24.03.1998), columns 8-14	1-15
Y	US 5,457,266 A (BEGE et al.) 10 October 1995 (10.10.1995), columns 1-3	5-7 and 16-26
Y	US 5,645,518 A (WAGH et al.) 08 July 1997 (08.07.1997), columns 3-9	10, 21, 29

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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document member of the same patent family

Date of the actual completion of the international search

15 October 2004 (15.10.2004)

Date of mailing of the international search report

24 NOV 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

P.O. Box 1450

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